REMARKS

Applicants respectfully traverse and request reconsideration.

Claim 1 has been amended to incorporate the limitations present in originally-filed Claim 6. Similarly, Claim 9 has been amended to incorporate the limitations present in originally-filed Claim 10. Accordingly, Claims 6 and 10 have been canceled without prejudice.

Claims 1, 2, 5 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2003/0030642 to Chen et al. ("Chen") in view of U.S. Patent Application Publication No. 2004/0169651 to Everitt et al. ("Everitt"). As amended, Claim 1 requires, among other things, that the pixel appearance determination circuit determines "a pixel appearance value based on the fragment data by dropping the fragment data having the least effect on pixel appearance, wherein dropping the fragment data further includes assigning the fragment data to be dropped with a no color designation." Applicants respectfully submit that no combination of Chen and Everitt, alone or in combination, teaches the claimed subject matter as presented above.

For instance, Chen appears to be directed towards a combined logic core and frame buffer capable of performing pixel fragment manipulation and processing on a single substrate thereby increasing bandwidth between the core and the memory. (See Title and Abstract.) In no instance does Chen teach or suggest assigning the fragment data to be dropped with a no color designation. Generally, Chen teaches that the logic core 50 as incorporated within an M chip 10 performs fragment operations directed towards one or more memory units 40 such as a frame buffer with the M chip 10. Because data never needs to leave the substrate of the M chip 10, the M chip's 10 memory organization permits very fast copying of data from buffer memory to texture memory. (See ¶¶ 0022, 0025.) For example, core logic may read data from the frame

buffer and repack it (i.e., reformat the data) into a selected texture format as desired by the system. In some instances, the repacking may necessitate reduction in a number of bits used to represent the texture from the number of bits in the source data (i.e., source data from the frame buffer). In these cases, the core logic determines which bits are least important to the texture representation and eliminates those bits. The repacked data is then written to texture memory. (¶ 0025.) Thus, while Chen appears to disclose a method whereby data stored in the frame buffer can be condensed or reduced and then repacked into the texture memory, Chen does not disclose the claimed subject matter of Claim 1, wherein dropping fragment data further includes assigning the fragment data to be dropped with a no color designation. In fact, Chen appears to be silent on the reassignment of any fragment data that is dropped with any sort of designation let alone the no color designation set forth in Claim 1.

Similarly, the Everitt reference provides a system whereby a depth range defining the minimum and maximum depth values for a light source associated with an image is used to determine whether portions of a scene are outside of the light source's depth range and thus are unaffected by the light source. Such shadow volume surface fragments, image fragments or pixels that lie outside of a light source's depth range are subsequently discarded prior to rendering (i.e., they are not rendered). (¶ 0030.) In another embodiment, Everitt provides a system whereby a fragment and associated data representing at least a portion of a geometric primitive may first be tested by a pixel ownership unit to determine whether the fragment is within the window or screen display area. If the fragment or a portion of the fragment lies outside of the window or screen display area, the pixel ownership unit appropriately discards the corresponding portion of the fragment. (¶ 0032.) In each instance, Everitt discloses that unnecessary fragments or portions thereof that lie outside a light source's depth range or

window/screen area are completely discarded and not assigned with a specific, no color designation as set forth in Claim 1. Thus, while Everitt discloses a system wherein pixels or fragments are discarded when not needed, and not because they have the least effect on pixel appearance, Applicants respectfully submit that Claim 1 is in proper condition for allowance over any combination of Chen in view Everitt.

Moreover, Applicants respectfully submit that the claimed subject matter present in Claim 1 is further patentable in view of any combination of U.S. Patent No. 6,204,859 to Jouppi et al. ("Jouppi"), as used to reject originally-filed Claim 6, in view of Chen and Everitt. Jouppi is directed towards a method and apparatus for determining a color of a pixel in a graphics system. Generally, Jouppi notes that multiple fragments of an image may be visible in any given pixel. Each visible fragment has a fragment value that includes the color of that fragment. However, for any given pixel only a predetermined number of fragment values are stored based on, among other things, predetermined memory availability and design (See Col. 5, ll. 39-42). Thus, when a new fragment is determined to be visible in the given pixel, one of the fragment values needs to be discarded before generating the color of the pixel. In one embodiment, the discarded fragment value may be the new fragment value or one of the stored fragment values. (See Abstract.) While Jouppi describes a system that drops fragment data, it fails to describe any system or method wherein a no color designation is assigned to the dropped fragment data.

Applicants respectfully draw the Examiner's attention to column 9, lines 25-47 and FIGs. 5B-5C of Jouppi. In this reference, Jouppi teaches that one of the fragment triples (i.e. fragment values) previously stored in the pixel memory 314 of the graphics memory 122 is replaced with a new fragment triple. "To execute this replacement the graphics accelerator 108 would write the data of the new fragment triple 410 over the data of the previously stored fragment triple 310, in

effect, discarding the data of fragment triple 310. Alternatively, memory can be deallocated for the fragment triple 310, and allocated for fragment triple 410." While Jouppi describes a variety of techniques for selecting which fragment triples (i.e. fragment values) are discarded, in each instance, Jouppi teaches that the new fragment triple overwrites the old fragment triple, or memory is deallocated for the old fragment triple and allocated for the new fragment triple. Thus, Jouppi fails to teach or suggest, alone or in combination with Chen and Everitt, a system and method wherein, among other things, fragment data is dropped and a no color designation is assigned to the dropped fragment data. Applicants respectfully submit that Claim 1 is in proper condition for allowance over any combination of the cited prior art.

Claims 2, 5 and 8 are claims dependent upon allowable base Claim 1. In addition to being allowable for the reasons stated above, Applicants respectfully submit that Claims 2, 5 and 8 contain sufficiently novel and nonobvious subject matter in view of Chen and Everitt. For instance, with respect to Claim 8, Applicants note that the cited portion of Everitt appears to be directed toward the opposite of Applicants' claimed subject matter. While Claim 8 requires, among other things, not dropping masked sample data such that "the masked sample data is used to determine the pixel appearance value," Everitt teaches that the masked portion of a fragment, as masked by a stencil test unit 425, is not rendered. (See ¶ 0042, lines 3-5). This is consistent with Everitt's "Background of the Invention" where it is taught that "[s]tencil buffers can mask off portions of the rendered image in shadow from a particular light source . . . [where t]he unmasked portions of the rendered image are then rendered to add the illumination from the light source." (¶ 0040, ll. 6-9.) In short, Applicants' masked data is used to determine a pixel appearance value while Everitt teaches to render the unmasked portions of the image.

Consequently, Applicants respectfully note that Claims 2, 5 and 8 are in proper condition for allowance.

Claims 3, 6 and 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Chen in view of Everitt and further in view of Jouppi. Similarly, Claim 4 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Chen in view of Everitt and further in view U.S. Patent No. 6,476,807 to Duluk, Jr. ("Duluk"). Applicants note that Claim 6 is canceled while respectfully repeating the relevant remarks made above with respect to Claim 1. Applicants respectfully repeat the relevant remarks made above and note that Claims 3, 4 and 7 depend from allowable base Claim 1 and further contain additional novel and nonobvious subject matter not present in any combination of the cited prior art. Accordingly, Applicants present the claims for immediate allowance.

Claims 9-13 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Jouppi. Applicants respectfully repeat the relevant remarks made above with respect to Claims 1-8. Because Jouppi, alone and in combination with the other cited prior art, fails to teach or suggest, among other things, dropping at least one of the stored fragment data and providing the dropped fragment data with a no color designation, Claims 9-13, with the exception of canceled Claim 10, are allowable for at least the same reasons presented above.

Moreover, Applicants respectfully note that Claims 9-13, with the exception of canceled claim 10, add additional novel and nonobvious subject matter. For instance, Claim 13 includes, among other things, the method "wherein before storing the fragment data, determining whether the fragment data includes masked sample data, wherein the masked sample data is not dropped and wherein the masked sample data is used to determine the appearance value for the pixel." In rejecting Claim 13, the Office Action cited Column 13, lines 23-44 of Jouppi. However, that

portion of the Jouppi fails to teach or suggest Applicants' claimed invention because (1) Jouppi appears to use a coverage mask after the fragment data is stored; and (2) Jouppi appears to use the coverage mask to link the subpixel samples to various stored fragment triples. For instance, with respect to FIG. 6D, the coverage mask 620 indicates that the fragment triple 310 is visible in subpixel samples S2, S3 and S4. The cited portion of Jouppi fails to teach or suggest the claimed subject matter of Claim 13 wherein the determination portion of the method is determined before storing the fragment data and wherein a determination is made whether the fragment data includes masked sample data, wherein the masked sample data is not dropped, but used to determine the appearance value for the pixel. For these reasons in addition to those stated above, Applicants respectfully present Claim 13 for allowance.

Applicants respectfully submit that the claims are in condition for allowance and that a timely Notice of Allowance be issued in this case. The Examiner is invited to contact the below-listed attorney if the Examiner believes that a telephone conference will advance the prosecution of this application.

Respectfully submitted,

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